

WHAT IS CLAIMED IS:

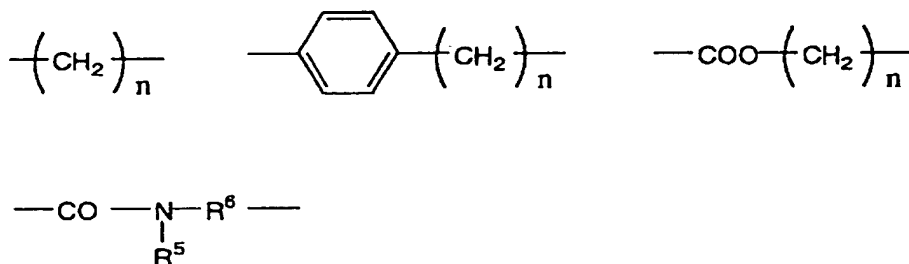
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1. A process for producing polymer fine particles comprising: dispersing a solution obtained by dissolving a hydrophobic polymer in a solvent immiscible with water in an aqueous phase comprising fine particles of an oxide or hydroxide of at least one element selected from the group consisting of elements belonging to 2 to 15 groups in the periodic table using a surfactant; or dispersing a solution obtained by dissolving a hydrophobic polymer in a solvent immiscible with water in an aqueous phase comprising a water-soluble resin; and then removing the solvent from the oil droplets to form polymer fine particles dispersed in water.

2. The process for producing polymer fine particles as claimed in claim 1, wherein a solution obtained by dissolving a hydrophobic polymer in a solvent immiscible with water is dispersed in the aqueous phase comprising fine particles of an oxide or hydroxide of at least one element selected from the group consisting of elements belonging to 2 to 15 groups in the periodic table using a surfactant, and then the solvent is removed from the oil droplets to form polymer fine particles dispersed in water; and the hydrophobic polymer has the structural unit represented by the following formula (I):



wherein  $R^1$ ,  $R^2$  and  $R^3$  each represents a hydrogen atom or a hydrocarbon group having 8 or less carbon atoms,  $R^4$  represents an alkoxy group or acyloxy group having 1 to 40 carbon atoms,  $k$  represents an integer of 0 to 2,  $m$  represents an integer of 0 to 3, the sum of  $k$  and  $m$  is 3 or less,  $X$  represents a monovalent metal or a hydrogen atom,  $Z$  represents a group selected from the group consisting of the following groups;

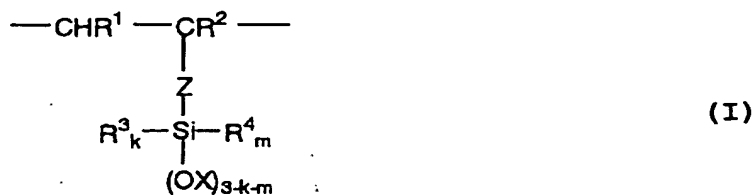


wherein  $R^5$  represents a hydrogen atom or a hydrocarbon group having 8 or less carbon atoms,  $R^6$  represents an alkylene group having 5 or less carbon atoms or a divalent organic residue formed by linking plural chain carbon atomic groups each other through a carbon atom or a nitrogen atom,  $n$  represents an integer of 0 to 4.

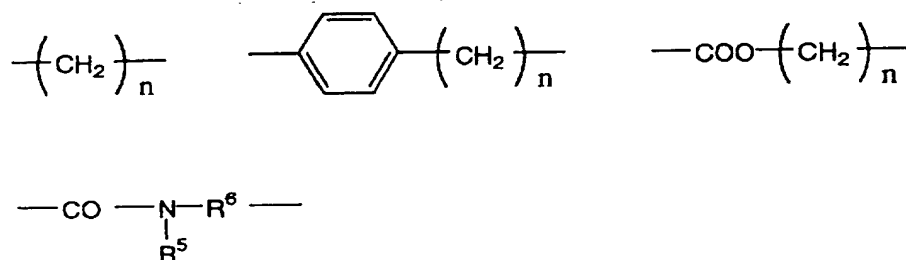
3. The process for producing polymer fine particles as claimed in claim 2, wherein a water-soluble resin is further included in the aqueous phase comprising fine particles of an oxide or hydroxide of at least one element selected from the group consisting of elements belonging to 2 to 15 groups in the periodic table.

4. The process for producing polymer fine particles as claimed in claim 3, wherein the water-soluble resin is at least one kind of resin selected from the group consisting of polyvinyl alcohol, polyacrylamide, polyvinyl pyrrolidone, polyacryl acetamide, polyoxazoline, polydimethyl acrylamide, polyethylene glycol, polyacrylic acid, polyvinylmethyl ether and polyethylene imine.

5. A lithographic printing plate precursor comprising on a support a hydrophilic image-recording layer; containing polymer fine particles obtained by a process for producing the polymer fine particles, wherein a solution obtained by dissolving a hydrophobic polymer in a solvent immiscible with water is dispersed in the aqueous phase comprising fine particles of an oxide or hydroxide of at least one element selected from the group consisting of elements belonging to 2 to 15 groups in the periodic table using a surfactant, and then the solvent is removed from the oil droplets to form polymer fine particles dispersed in water; and the hydrophobic polymer has the structural unit represented by the following formula (I):

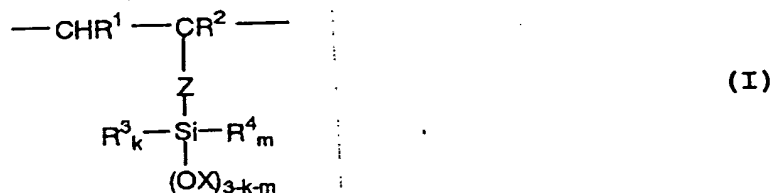


wherein  $R^1$ ,  $R^2$  and  $R^3$  each represents a hydrogen atom or a hydrocarbon group having 8 or less carbon atoms,  $R^4$  represents an alkoxy group or acyloxy group having 1 to 40 carbon atoms,  $k$  represents an integer of 0 to 2,  $m$  represents an integer of 0 to 3, the sum of  $k$  and  $m$  is 3 or less,  $X$  represents a monovalent metal or a hydrogen atom,  $Z$  represents a group selected from the group consisting of the following groups;

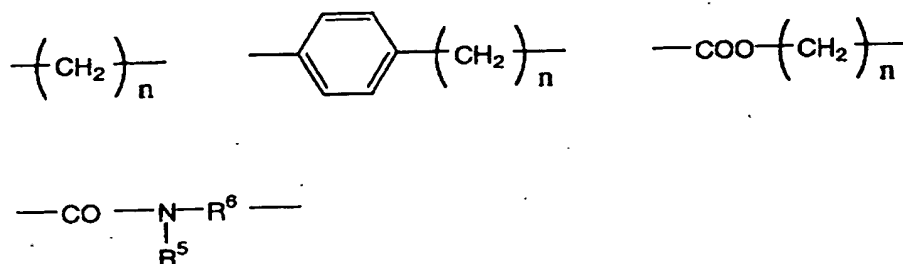


wherein  $R^5$  represents a hydrogen atom or a hydrocarbon group having 8 or less carbon atoms,  $R^6$  represents an alkylene group having 5 or less carbon atoms or a divalent organic residue formed by linking plural chain carbon atomic groups each other through a carbon atom or a nitrogen atom,  $n$  represents an integer of 0 to 4; and having a property which can be converted from hydrophilic to hydrophobic by heating.

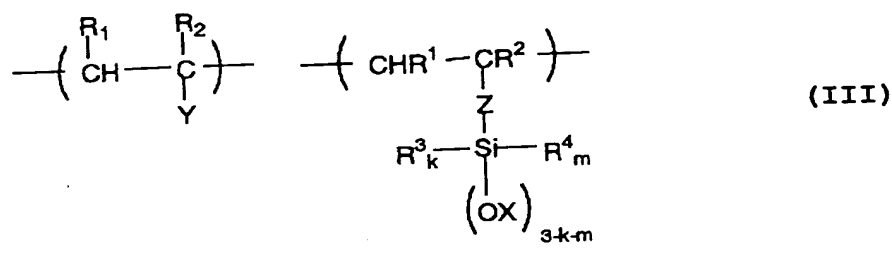
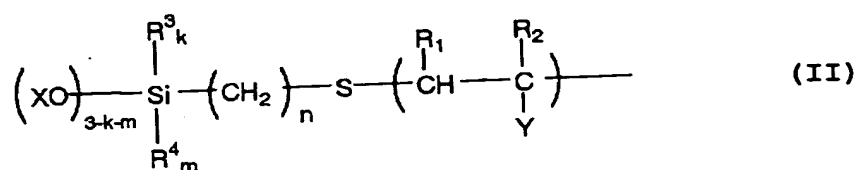
6. A process for producing polymer fine particles as claimed in claim 1, wherein a solution obtained by dissolving a hydrophobic polymer in a solvent immiscible with water is dispersed in an aqueous phase comprising a water-soluble resin, and then the solvent is removed from the oil droplets to form polymer fine particles dispersed in water; and the hydrophobic polymer has the structural unit represented by the following formula (I), and the water-soluble resin has the structural unit represented by the following formula (II) or (III):



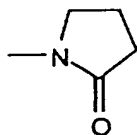
wherein  $R^1$ ,  $R^2$  and  $R^3$  each represents a hydrogen atom or a hydrocarbon group having 8 or less carbon atoms,  $R^4$  represents an alkoxy group or acyloxy group having 1 to 40 carbon atoms,  $k$  represents an integer of 0 to 2,  $m$  represents an integer of 0 to 3, the sum of  $k$  and  $m$  is 3 or less,  $X$  represents a monovalent metal or a hydrogen atom,  $Z$  represents a group selected from the group consisting of the following groups;



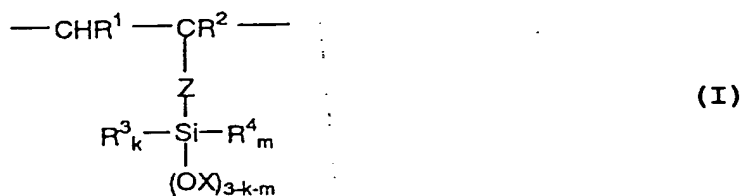
wherein  $R^5$  represents a hydrogen atom or a hydrocarbon group having 8 or less carbon atoms,  $R^6$  represents an alkylene group having 5 or less carbon atoms or a divalent organic residue formed by linking plural chain atomic groups each other through a carbon atom or a nitrogen atom,  $n$  represents an integer of 0 to 4:



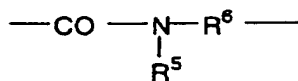
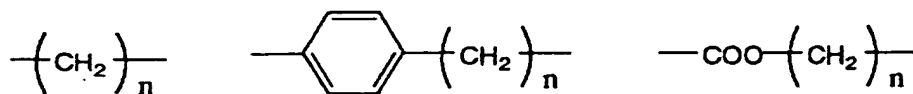
wherein  $R^1$  to  $R^4$ ,  $X$ ,  $k$  and  $m$  have the same meaning as those in formula (I),  $Y$  represents  $-NHCOCH_3$ ,  $-CONH_2$ ,  $-CON(CH_3)_2$ ,  $-COCH_3$ ,  $-OH$ ,  $-CO_2M$ ,  $-OCH_3$  or the following group,  $M$  represents a hydrogen atom or a metal ion, and  $n$  represents an integer of 1 to 8.



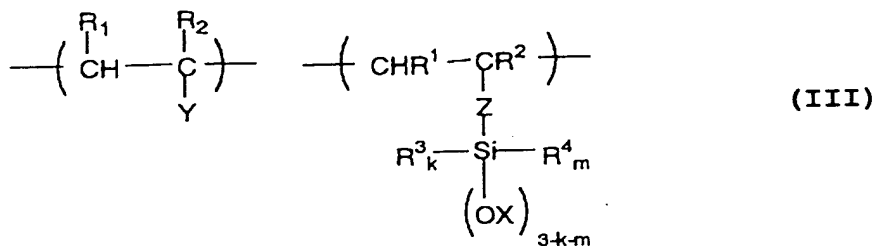
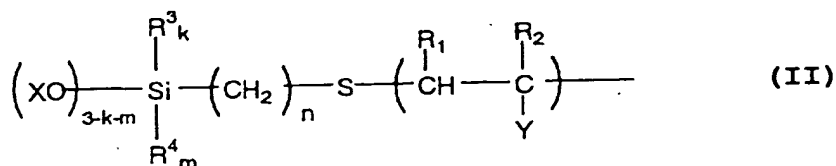
7. A lithographic printing plate precursor comprising on a support a hydrophilic image-recording layer: containing polymer fine particles obtained by a process for producing the polymer fine particles, wherein a solution obtained by dissolving a hydrophobic polymer in a solvent immiscible with water is dispersed in an aqueous phase comprising a water-soluble resin, and then the solvent is removed from the oil droplets to form polymer fine particles dispersed in water; and the hydrophobic polymer has the structural unit represented by the following formula (I), and the water-soluble resin has the structural unit represented by the following formula (II) or (III):



wherein  $R^1$ ,  $R^2$  and  $R^3$  each represents a hydrogen atom or a hydrocarbon group having 8 or less carbon atoms,  $R^4$  represents an alkoxy group or acyloxy group having 1 to 40 carbon atoms,  $k$  represents an integer of 0 to 2,  $m$  represents an integer of 0 to 3, the sum of  $k$  and  $m$  is 3 or less,  $X$  represents a monovalent metal or a hydrogen atom,  $Z$  represents a group selected from the group consisting of the following groups;



wherein  $\text{R}^5$  represents a hydrogen atom or a hydrocarbon group having 8 or less carbon atoms,  $\text{R}^6$  represents an alkylene group having 5 or less carbon atoms or a divalent organic residue formed by linking plural chain atomic groups with each other through a carbon atom or a nitrogen atom,  $n$  represents an integer of 0 to 4:



wherein  $\text{R}^1$  to  $\text{R}^4$ ,  $\text{X}$ ,  $k$  and  $m$  have the same meaning as those in formula (I),  $\text{Y}$  represents  $\text{---NHCOCH}_3$ ,  $\text{---CONH}_2$ ,  $\text{---CON}(\text{CH}_3)_2$ ,  $\text{---COCH}_3$ ,  $\text{---OH}$ ,  $\text{---CO}_2\text{M}$ ,  $\text{---OCH}_3$  or the following group,  $\text{M}$  represents a hydrogen atom or a metal ion, and  $n$  represents an integer of 1 to 8; and having a property which can be converted from hydrophilic to hydrophobic by heating.

